ANS

October 5, 2000

Documents Management Branch (HFA – 305)
Food and Drug Administration
5630 Fisher Lane Rm. 1061
Rockville, MD 20852

5979 '00 OCT -6 A9:07

Re: FDA Docket Numbers: 00D-1455

To whom it may concern:

This letter is in response to Food and Drug Administration's Draft Guidance for Industry; Special Control Guidance for Premarket Notification for Totally Implanted Spinal Cord Stimulators for Pain Relief; Availability.

Please consider the following comments by section for inclusion in the final Industry Guidance.

510 (k) Submission Content

The wording in the 1st paragraph should be changed to the following to clarify that implanted and totally implanted spinal cord stimulators for pain relief may be considered as predicate devices.

"Any 510(k) submission premarket notification procedures described in 21 CFR Part 807, Subpart E, for the FDA's determination that the new device is substantially equivalent to a legally-marketed predicate (existing) device identified as an implanted or totally implanted spinal cord stimulator for pain relief should follow the format below and should contain all specified information that is applicable to the device".

Administrative and General Information, Descriptive Information, Intended Use/Indication for Use, Labeling and Device Description

ANS believes that the suggested General and Administrative Descriptive Information, Intended Use/Indication for Use, Labeling and Device Description information in the guidance document is reasonable and consistent with general requirements outlined in other previously published FDA guidances related to premarket notifications.

00D-1455

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Attachment I

Labeling

ANS believes that the labeling requirements described in the guidance document in conjunction with the use of other published FDA labeling guidances will help reasonably assure the safety and effectiveness of the IPG device. ANS believes that the following specific labeling requirements are appropriate except were noted. ie ***Life Table***

Prescription Statement

Totally implanted SCSs are prescription devices. Prescription devices must be labeled in accordance with 21 CFR 801.109.

User Manuals

User manuals should be provided for physician use and patient use. In addition to the prescription statement described above, a manual should include the following information:

1. Description of the device and its accessories;

2. Illustrations of the device and its accessories;

3. Description of all features, functions, output modalities, and specifications;

4. Description of all user-accessible controls;

5. Indicators, markings, and/or labels on the device and accessories which provide information regarding the function or meaning of each control, display, output jack, etc.;

6. Directions for cleaning and/or maintenance where appropriate;

7. Storage and sterilization information;

8. Statements of indications, contraindications, warnings, precautions, and adverse reactions, as described in detail below; and

9. The physician manual should include instructions for correctly implanting, testing, using, and explanting the device.

10. A separate user manual for the patient in lay language should be provided.

The remainder of this labeling attachment lists statements that should be included prominently in the labeling for totally implanted spinal cord stimulators. These statements address the indications, contraindications, warnings, precautions, and adverse effects associated with the use of totally implanted spinal cord stimulators.

Indications for Use

Totally implanted SCSs are indicated for use as an aid in the management of chronic, intractable pain of the trunk or limbs.

Life Table

The section requiring a life table should be modified. The guidance currently states in the Life Table section that " A chart illustrating the estimated service life (i.e. battery life) of the device at various output usages should be provided."

A chart is just one means of showing battery longevity based on input parameter settings. Another reasonable approach is to provide an equation that allows easy determination of battery longevity based on a set of input variables. Therefore, ANS recommends broadening the requirement to include either of these methods, or any other reasonable method of showing battery longevity based on parameter settings.

The language in the Life Table section should be changed to state: **"A chart, equation or any other reasonable means of illustrating the estimated service life (i.e. battery life) of the device at various output usages should be provided."**

Shelf Life

For all implanted life-limiting components, a statement as to shelf life should be included on the labeling.

Contraindications

The contraindications should specifically address those patients who fail to receive pain relief during test stimulation.

Warnings

The warnings should specifically address the following:

1. Use of totally implanted SCS devices in patients with cardiac demand pacemakers;

2. Safety of totally implanted SCS devices for use during pregnancy;

3. Effects of postural changes on totally implanted SCS devices;

4. Burns that may result if the generator case is ruptured or pierced; and

5. Effects of external sources of electromagnetic interference (EMI) devices on totally implanted SCS devices. All adverse effects that have been determined from electromagnetic compatibility (EMC) testing should be included in this warning.

Precautions

The precautions should specifically address the following:

1. Effects from the operation of other implanted medical devices on totally implanted SCS devices;

2. Effects of high output ultrasonic devices, radiation therapy, diathermy devices and external defibrillation devices on totally implanted SCS devices; and

3. Magnetic resonance imaging (MRI) compatibility issues.

Adverse Effects

The labeling should list the following risks associated with use of totally implanted SCS devices and the surgical implantation procedures:

1. Lead migration, which can result in changes in stimulation and subsequent reduction in pain relief;

2. Device failure, including battery failure, lead breakage, hardware malfunction, and loose connections which can lessen or eliminate stimulation and can result in ineffective pain control;

3. Adverse tissue reaction due in part to biocompatibility concerns;

4. Skin erosion over the IPG;

5. Surgical procedural risks, including temporary pain at the implant site, infection, cerebrospinal fluid (CSF) leakage and although rare, epidural hemorrhage, seroma, hematoma, and paralysis;

6. External sources of electromagnetic interference may cause the device to malfunction and may change stimulation parameters;

7. If the device is not MRI compatible, adverse consequences can result, including heating of tissue, image artifacts, induced voltages in the IPG and/or leads, or dislodgment.

Attachment II

Section I: Pulse Generator Output Specifications

ANS generally agrees with the suggested information requested in the Technological Reporting section in Attachment II of the guidance document. However, we suggest that the table in Section 1 be modified to include a glossary of terms as well as reformatted so that the requested comparative information is presented in logical categories for ease of interpretation by the device industry. Attached is the suggested reformatted table, which includes a glossary of terms as well as the addition of relevant parameters for this type of device. (see Appendix 1)

Testing Stimulation and Oscilloscope Tracing

ANS believes that the information requested in these sub-sections of the guidance are appropriate for this type of device.

Section 2: Leads, Electrodes, and Programmer Descriptions

ANS believes that the information requested in these sub-sections of the guidance are appropriate for this type of device.

Battery

ANS believes that the information requested in this sub-section of the guidance is appropriate for this type of device. However, ANS disagrees that the interval between the activation of the "elective replacement indicator " and actual end of life of the device should be specified. The time interval between the activation of the indicator and the actual end of life may not be readily apparent to the patient since the indicator for this type of device is typically located in the patient

programmer. The patient will not know when the indicator is signaled to be activated if he/she does not carry the programmer at all times and constantly monitor the device with the programmer. Therefore, we do not believe that providing the specific time between the activation of the indicator and the actual end of life of the device should be considered as a parameter to determine the safety, effectiveness or substantial equivalence of this type of device.

Section 3: Description of Accessories

ANS believes that the information requested in this sub-section of the guidance is appropriate for this type of device.

Section 4: Description of Software/Firmware/Microprocessor Control

ANS believes that the information requested in this sub-section of the guidance is appropriate for this type of device. However, the guidance excludes many of the document requirements in the 1998 Guidance for the Content of Premarket Submissions for Software Contained in Medical Devices. This may lead to confusion over which guidance takes precedence. ANS suggests this section simply refer the sponsor to the 1998 guidance document.

Attachment III – Device Testing and Manufacturing

Section 1: In Vitro Component Testing

ANS believes that the information requested in this sub-section of the guidance is appropriate for this type of device.

Section 2: In Vitro Finish Device Testing

ANS believes that the information requested in this sub-section of the guidance is appropriate for this type of device.

Section 3: Environmental Testing

ANS believes that the information requested in this sub-section of the guidance is appropriate for this type of device.

Section 4: Electromagnetic Compatibility (EMC) Testing

ANS believes that the information requested in this sub-section of the guidance is appropriate for this type of device.

Section 5: Reliability Testing

ANS believes that the information requested in this sub-section of the guidance is appropriate for this type of device.

Section 6: Programmer Testing

ANS believes that the information requested in this sub-section of the guidance is appropriate for this type of device.

Section 7: Manufacturing

ANS believes that the information requested in this sub-section of the guidance is appropriate for this type of device. However, the reference to 21 CFR 812.20(a)(3) is incorrect. The reference should be change to 21 CFR 812. 20 (b)(3).

Section 8: Sterilization

ANS believes that the information requested in this sub-section of the guidance is appropriate for this type of device.

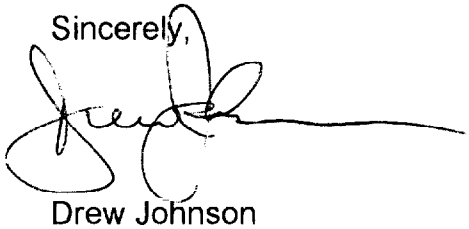
Section 9: Biocompatibility

ANS believes that the information requested in this sub-section of the guidance is appropriate for this type of device.

On behalf of ANS, I am pleased to submit these comments in support of the proposed guidance document.

If you have any questions about these comments, please don't hesitate to call me at 972-309-8089.

Sincerely,



Drew Johnson
Director, Regulatory Affairs

APPENDIX 1

Glossary of terms

Pulse Output	Independent pulse generating circuitry for controlling pulse amplitude and pulse width
Electrode Channels	Pulse steering circuitry, which enables the pulse output to be routed to an electrode. Each electrode channel can be set or programmed as any or all of the following Electrode channel polarities (anode, cathode or OFF).
Output Safety Features	Method of disabling or limiting pulse output.
Electrode Material	Electrode surface chemical composition. Material can affect the safe limits for charge per phase and charge density.
Output Mode	Sequence of delivering Pulse waveforms.
Pulse Waveform	A single pulse delivered to electrodes to elicit a neurological response. Pulses can be monophasic or biphasic. Biphasic pulses can be symmetric or asymmetric. The first phase of a biphasic pulse is defined as the pulse width. Each phase of a biphasic pulse should be charge balanced, which can be accomplished by capacitive coupling or electronic charge phase control. Pulse shape can include rectangular, quasirectangular and sinusoidal.
Pulse Frequency	Reciprocal of the interval between two consecutive pulse waveforms.

Section 1: Pulse Generator Output Specifications

	New Device	**Predicate Device**
510(k) Number	(To Be Assigned)	K
Device Name, Model		
Manufacturer		
Number of Pulse Outputs		
Number of Electrode Channels		
Polarities of Electrode Channels		
Output safety features		

An output type is defined (for reporting purposes) as a version of a waveform produced by the unit. For example, biphasic symmetrical, biphasic asymmetrical and monophasic would all be considered separate output types. A copy of the following information

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should be completed for each output type. If a specific parameter is not applicable (N/A), this should be noted.

Pulse Waveform Characteristics	**New Device**	**Predicate Device**
Waveform (e.g., biphasic)		
Shape (e.g., rectangular, sinusoidal)		
Pulse Symmetry (e.g., symmetrical, asymmetrical)		
Maximum Output Voltage (Load range of 300 to 2000Ω specify units)		
Maximum Output Current (Load range of 300 to 2000Ω specify units)		
Pulse Width Range (specify units, first phase)	±____%	±____%
Second Phase Duration (state range, if applicable)	±____%	±____%
Pulse Frequency Range (specify units)	±____%	±____%
Electrode Material		
Method for achieving phase charge balance (e.g., Capacitive coupling)		
Maximum Net Charge (μC per pulse)	@ 500 Ω	@ 500 Ω
Maximum Average Leakage Current (nA)	@ 500 Ω	@ 500 Ω
Maximum Phase Charge (μC)	@ 500 Ω	@ 500 Ω
Maximum Phase Charge Density ($\mu C/cm^2$)	@ 500 Ω	@ 500 Ω
Maximum Current Density (mA/cm^2)	@ 500 Ω	@ 500 Ω
Maximum Delivered Power (W)	@ 500 Ω	@ 500 Ω

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An output mode is defined (for reporting purposes) as a method of delivering Pulse Waveforms. For example, continuous, bolus, and dose (cycle) would be considered as output modes. A copy of the following information should be completed for each output mode.

Pulse Output Mode	**New Device**	**Predicate Device**
Output Mode Type (e.g., continuous, bolus, dose)		
ON Time (seconds)	±____%	±____%
OFF Time (seconds)	±____%	±____%
Multiwaveform (e.g., synchronous, alternating)		
Additional Features, if applicable		

Notes:

Variable Parameters: For continuously variable parameters, specify the full range; for parameters with discrete settings, specify all available selections.

Density Measurements: Maximum current density and power density values should be calculated using the conductive surface area of the smallest electrode provided/recommended for use with the unit; sample calculations should be provided. The maximum power density should be based on the maximum duty cycle and should be averaged over an appropriate time frame.

Maximum Current Density and Phase Charge: Values shall be identified for each electrode material used.

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